

REMARKS

Claims 1-5 were pending in this application.

Claims 1-5 have been rejected.

No claims have been allowed.

Claims 1-5 have been amended as shown above.

Claims 6-20 have been added.

Claims 1-20 are now pending in this application.

Reconsideration of the claims is respectfully requested.

I. CLAIM OBJECTIONS

The Office Action objects to Claim 2 because it contains two dependent claims. The Office Action states that the second paragraph of Claim 2 has been renumbered as Claim 3 and that Claims 3 and 4 have been renumbered as Claims 4 and 5. The Applicants thank the Examiner for renumbering the claims. The Applicants agree with the Examiner's amendment and have shown the proper claim numbering above. The Applicants respectfully request withdrawal of the objection.

II. 35 U.S.C. § 102 – Anticipation

The Office Action rejects Claims 1-5 under 35 U.S.C. § 102(b) as being anticipated by Chung-Yu, "A 1.8GHz CMOS Quadrature Voltage-Controlled Oscillator (VCO) Using the Constant-Current LC Ring Oscillator Structure" ("*Chung-Yu*"). The Office Action also

rejects Claims 1-5 under 35 U.S.C. § 102(b) as being anticipated by Duncan et al., "A 1GHz Quadrature Sinusoidal Oscillator." ("*Duncan*"). These rejections are respectfully traversed.

A cited prior art reference anticipates the claimed invention under 35 U.S.C. § 102 only if every element of a claimed invention is identically shown in that single reference, arranged as they are in the claims. MPEP § 2131; *In re Bond*, 910 F.2d 831, 832, 15 U.S.P.Q.2d 1566, 1567 (Fed. Cir. 1990). Anticipation is only shown where each and every limitation of the claimed invention is found in a single cited prior art reference. MPEP § 2131; *In re Donohue*, 766 F.2d 531, 534, 226 U.S.P.Q. 619, 621 (Fed. Cir. 1985).

Chung-Yu recites a voltage-controlled oscillator (VCO). (*Page 378, Abstract*). The VCO includes two differential inverters (labeled "INV 1" and "INV 2"). (*Figure 4*).

Regarding Claim 1, *Chung-Yu* fails to anticipate a multiphase LC oscillator that includes multiple units, where each unit includes a "voltage-to-current converter" and "an LC oscillator." The Office Action relies on the differential inverter of *Chung-Yu* as anticipating the "voltage-to-current converter" recited in Claim 1. However, *Chung-Yu* specifically recites that the differential inverters receive voltage signals as input and produce voltage signals as output. (*Page 379, Left column, First paragraph; Figure 4*). As a result, the differential inverters of *Chung-Yu* cannot anticipate the voltage-to-current converter recited in Claim 1.

Regarding Claim 4, *Chung-Yu* fails to disclose any voltage-to-current converter. As a result, *Chung-Yu* fails to anticipate the voltage-to-current converter recited in Claim 4. Also, the Office Action relies on a control voltage (V_C) and a bias resistor (R_1) of *Chung-Yu* as anticipating the "compensation means" recited in Claim 4. However, *Chung-Yu* explicitly states

that the control voltage and bias resistor provide a reverse bias for a diode in the differential inverter. (*Page 379, Left column, Last paragraph – Right column, First paragraph*). *Chung-Yu* lacks any mention of using the control voltage and bias resistor to “compensate for a phase shift” as recited in Claim 4.

Regarding Claim 5, *Chung-Yu* fails to anticipate using a voltage-to-current converter. *Chung-Yu* therefore fails to anticipate “converting [an] incoming signal into a current signal” as recited in Claim 5.

For these reasons, *Chung-Yu* fails to anticipate the Applicants’ invention as recited in Claims 1, 4, and 5 (and their dependent claims).

Duncan recites an oscillator that uses two second-order low-pass filters connected in a feedback loop. (*Page 6.2.1, Right column, Second paragraph*). Each low-pass filter includes multiple inductors, multiple capacitors, and a group of transistors. (*Figure 2*).

Regarding Claim 1, the Office Action asserts that *Duncan* discloses the use of LC oscillators because the low-pass filters include inductors and capacitors. (*Office Action, Page 3, Second paragraph*). The Applicants respectfully note that while the low-pass filters include inductors and capacitors, nothing in *Duncan* states that the inductors and capacitors are arranged to form an LC oscillator as recited in Claim 1. The mere fact that a circuit includes an inductor and a capacitor does not establish that the inductor and capacitor are arranged to form an LC oscillator.

Similarly, the Office Action asserts that *Duncan* discloses the use of a voltage-to-current converter because the low-pass filters include four transistors (Q_1 through Q_4). (*Office Action,*

Page 3, Second paragraph). The Applicants respectfully note that while the low-pass filters include a number of transistors, there is no mention that the transistors act as a voltage-to-current converter. Moreover, the transistors labeled Q_{3a} and Q_{3b} are not connected to the other transistors except through the inductors. (*Figure 2*). As a result, if the transistors labeled Q_{3a} and Q_{3b} form part of the voltage-to-current converter, the inductors would also form part of the voltage-to-current converter. In that case, the inductors would not form part of an LC oscillator as asserted in the Office Action. Based on this, the Office Action fails to show that *Duncan* discloses the use of LC oscillators and voltage-to-current converters as recited in Claim 1.

Regarding Claim 4, the Office Action asserts that a voltage V_B provided to two transistors (Q_{4a} and Q_{4b}) anticipates a voltage-to-current converter comprising "compensation means to compensate for a phase shift." As described above, there is no mention in *Duncan* that the transistors act as a voltage-to-current converter. Moreover, *Duncan* contains no mention that V_B represents a bias voltage used to control a "phase shift" of a voltage-to-current converter as recited in Claim 4.

Regarding Claim 5, as described above, there is no mention in *Duncan* that the inductors and capacitors act as LC oscillators or that the transistors act as a voltage-to-current converter. As a result, *Duncan* contains no mention of "converting the incoming signal into a current signal" or "providing the current signal to an LC oscillator" as recited in Claim 5.

For these reasons, *Duncan* fails to anticipate the Applicants' invention as recited in Claims 1, 4, and 5 (and their dependent claims).

Accordingly, the Applicants respectfully request withdrawal of the § 102 rejections and

full allowance of Claims 1-5.

III. NEW CLAIMS

The Applicants have added new Claims 6-20. The Applicants submit that no new matter has been added. The Applicants respectfully request entry and full allowance of Claims 6-20.

SUMMARY

For the reasons given above, the Applicants respectfully request reconsideration and allowance of pending claims and that this application be passed to issue. If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Applicants respectfully invite the Examiner to contact the undersigned at the telephone number indicated below or at *wmunck@davismunck.com*.

The Commissioner is hereby authorized to charge any additional fees connected with this communication or credit any overpayment to Davis Munck Deposit Account No. 50-0208.

Respectfully submitted,

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